Potential Transport of Harmful Algae through Relocation of Bivalve Molluscs

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Aquaculture and restoration activities with bivalve molluscs often include moving individuals from one body of water to another. Our study tests the hypothesis that harmful algae ingested by source populations of shellfish can be introduced into new environments by means of these shellfish relocations.

Cultures of several harmful algal strains, including *Prorocentrum minimum, Alexandrium fundyense, Heterosigma akashiwo, Aureococcus anophagefferens, Gymnodinium mikimotoi,* and *Alexandrium monilatum*, were fed to various species of bivalve molluscs, including *Crassostrea virginica, Argopecten irradiants irradians, Mercenaria mercenaria, Mytilus edulis, Mya arenaria, Venerupis philippinarum*, and *Perna viridis*, to assess the ability of the algal cells to pass intact through the digestive tracts of the shellfish and subsequently grow. Ten individuals of each shellfish species were exposed for two days to a simulated harmful algal bloom at a natural bloom concentration. The shellfish were removed after two days of exposure and kept for two more days in ultrafiltered seawater. Feces and pseudofeces were collected after 24 and 48 additional hours and observed under the microscope for the presence or absence of intact, potentially viable cells or temporary cysts of the algae. Subsamples of biodeposits were transferred into both algal culture medium and filtered seawater (FSW) and monitored microscopically for algal growth. Intact cells of most harmful algal species tested were seen in biodeposits. Generally, harmful algae from the biodeposits collected in the first 24 hours after transfer re-established growing populations, but algae were less often able to recover from the biodeposits collected after 48 hours. These data provide evidence that transplanted bivalve molluscs may be vectors for the transport of harmful algae and that a short period of "depuration" may mitigate this risk. Further, preliminary results indicate that emersion may also serve to mitigate the risk of transport.

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